Mc D's Menu Nutritional Analysis

Introduction

Purpose

- Help customers understand the nutrional values so that they can make informed decisions.

- To help the business for finding loop holes to fix and opportunities that they can take benefit of.

Dataset

- Dataset comprises of 20+ columns each of which represents a unique nutritional component.
- This dataset considers more than 200 items from different categories.

Methodology

Tools Used

- Python (pandas, matplotlib)

Analytical Technique Used

- Descriptive Analytics
- Diaganostic Analytics

Workflow

Before understanding the workflow of dataset I want to firstly explain some data points of this dataset which could be confusing in start.

For most of the nutrients that are mentioned in this dataset. There's a follow up column which goes like nutrientName % Daily Value.

This means the contribution of nutrient from this meal towards your daily intake.

For example if for any nutreint X the X value is 12 and X % Daily Value is 50. It means that this food item is giving 50% of X nutrient in a single meal.

Meaning this food item is rich in X.

NOTE: Ideally a single meal should not contribute more than 25% to 30%, because it complicates the digestion for other nutrients. Because we are supposed to complete our nutrient intake throughout a whole day.

- Performed EDA in Python, using pandas, matplotlib, seaborn.
- Generated visualizations, to simplify the complex looking table structures to generate insights.
- Performed aggregate operations over several available categories, create visualizations for the same.

Challenges

- Only challenge was to understand, the concept of %Daily Value.
  Took help of internet and Generative AI to understand it, making my further analysis easier.

- Other challenge was to finding opportunities for business, that can help them, as this dataset majorly helps to educate the customers about the adverse effect of these food items, if consumed more.
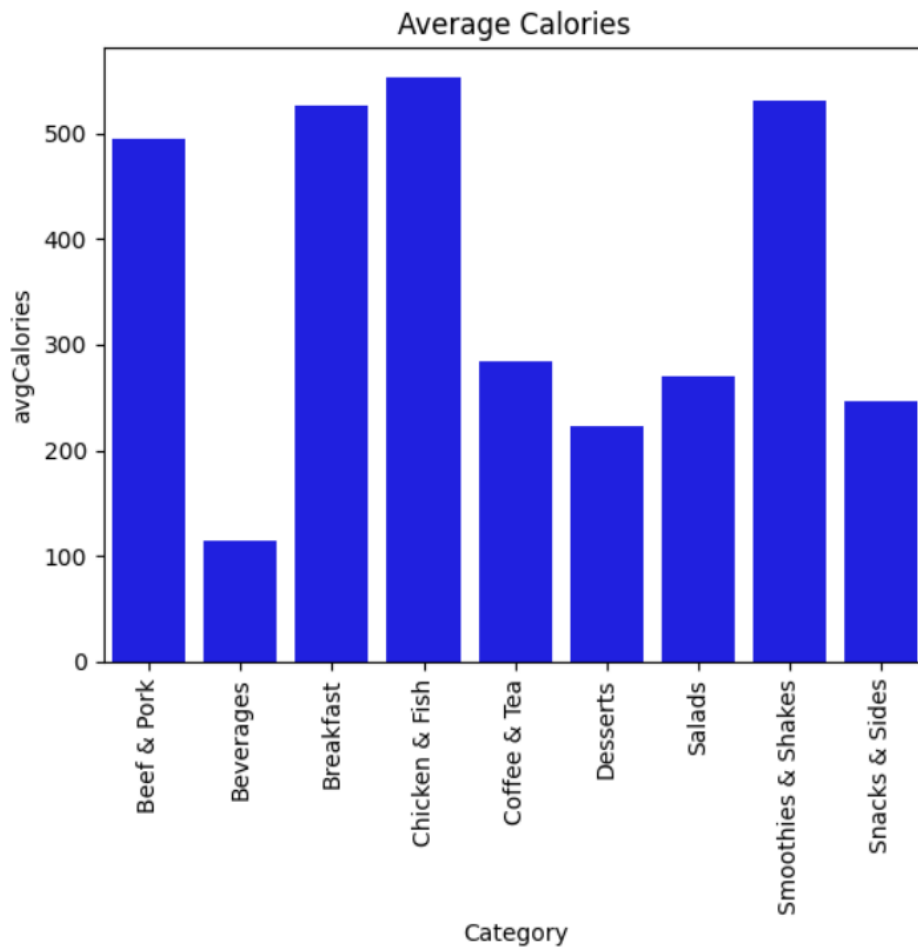
Findings:

There are total of 260 items available for sale.

There are a total of 9 Categories available. They are:
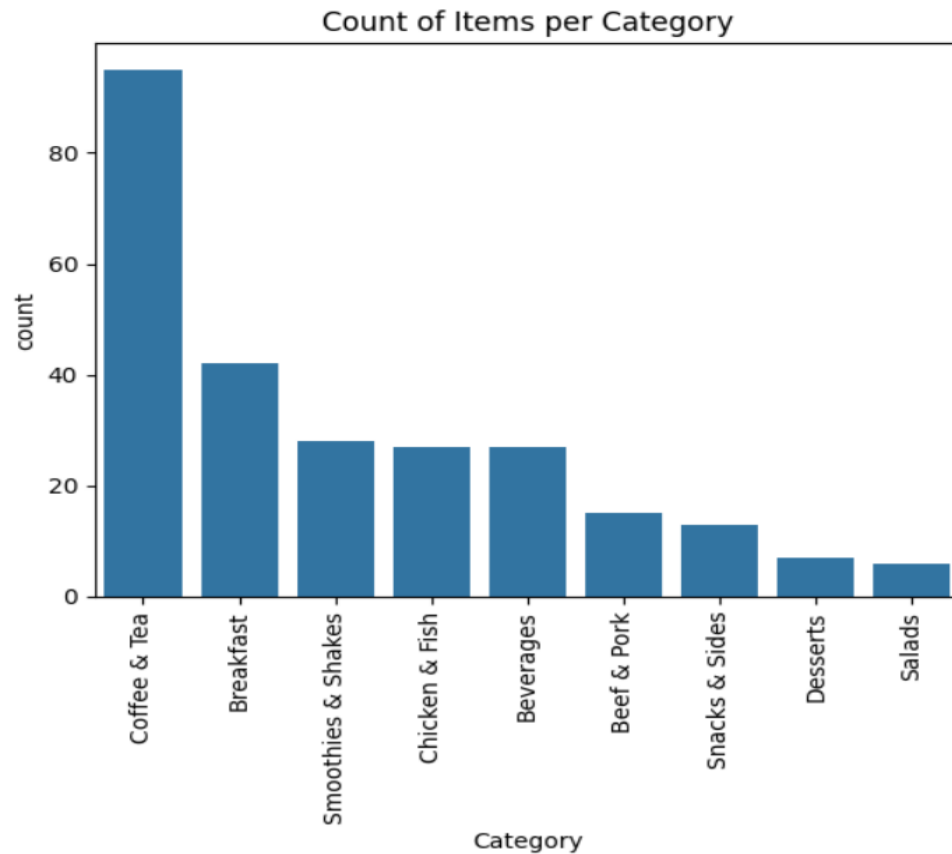
It is clear that **Coffee & Tea** has the most amount of items available as compared to other categories, it counts to 95.
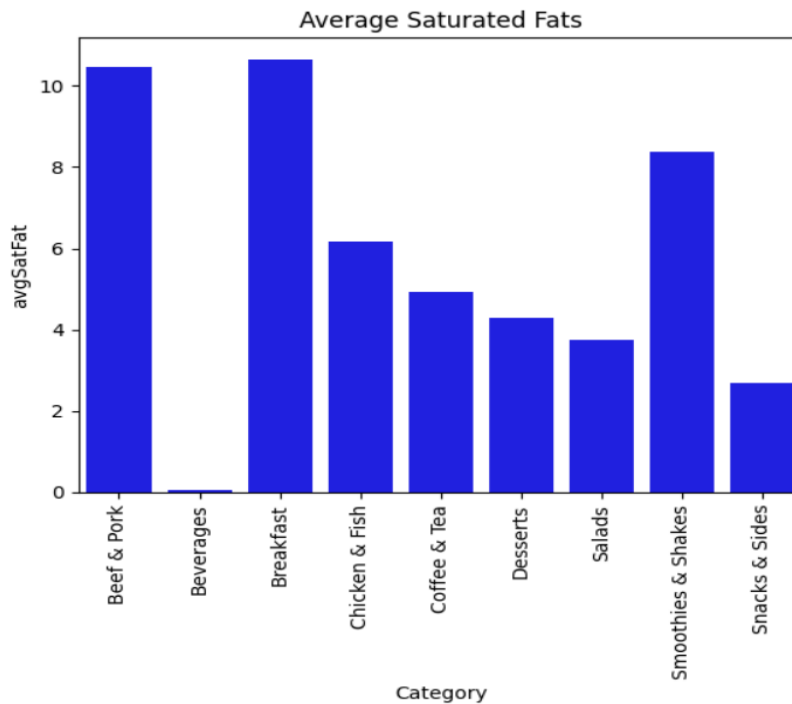
Followed up by **Breakfast** with 42 and **Smoothies & Shakes** and **Chicken & Fish** & **Beverages** with 28, 27 and 27.

Average Calories

- Of all categories **Chicken & Fish** has the *most* amount of Calories.
- Followed up by **Smoothies & Shakes** and **Breakfast** and **Beef & Pork.**
- **Beverages** amount for the *least* amount of Calories.
- For customers who are willing to have meal that has a high caloric count, they have about more than 4 categories to choose with a total of 97 items.
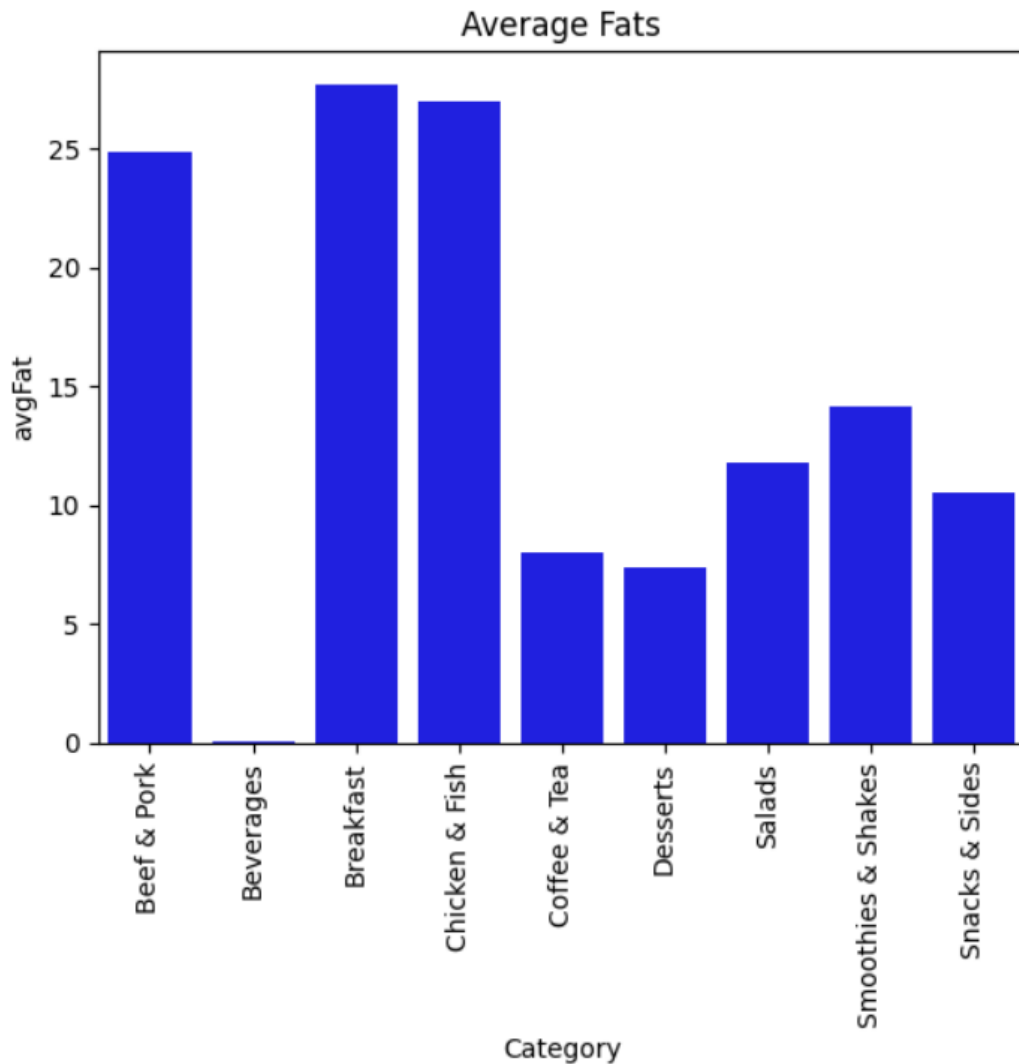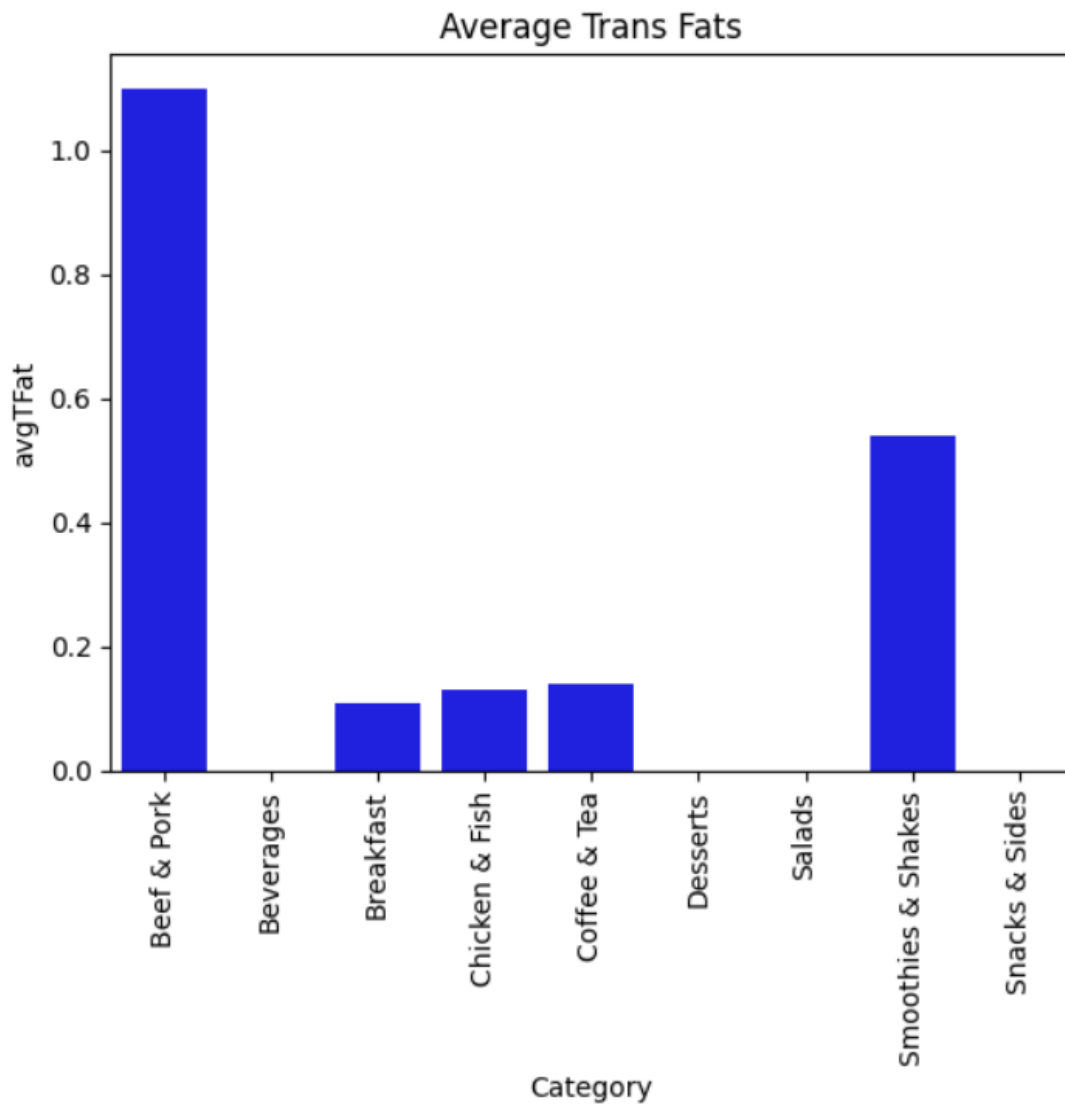
Average Fats

- The category **Breakfast** accounts for most amount of Fats.
- Followed by **Chicken & Fish** and **Beef & Pork** resepectively.
- The most important fact here is that **Beverages** contains the minimum amount of average fats amounting to only 0.9. Only 1 item in **Beverages** has *Total Fat* value of 2.5, rest are zero that, item is **1% Low Fat Milk Jug**.
- There are around 97 items that contains Fat levels more than the advised limit for a single meal.

Average Saturated Fats

- For sat. fats, the distribution looks similar to that of Total Fats, with minor changes.
- Like the last time **Beverages** here maintained the spot for least amont of sat. fats.
- **Breakfast** leads the chart, followed up by **Beef & Pork** and **Smoothies & Shakes.**
- The interesting fact over here is that **Chicken & Fish** is replaced by **Smoothies & Shakes.**
- This is because **Chicken & Fish** are *rich* in Unstarurated Fats, which are beneficial for health, plus it is made sure that the sat fat level for these should be controlled.
- This is to be kept in mind that the more the amount of Sat. Fats, the more is the chance of increasing Cholesterol level in blood, giving rise to heart diseases.
- There are 112 items, that contains saturated fats more than advised amount per meal.
- There are total of 3 items that contains more than the advised limit for a day in a single meal.
- They are **Chicken McNuggets, McFlurry with M&M's Candies (Medium), Frappé Chocolate Chip (Large)**. All of them had a value of 20.

- Most shocking thing about this is that **Frappé Chocolate Chip (Large)** is from **Coffee & Tea** category, which was the fifth in terms of avg saturated fats out of 9.


Average Trans Fats

- The ideal amount of trans fat in any meal should be eaual to zero, because this fat is harmful to health and lead to heart diseases.
- On average **Beef & Pork** has the most amount of Trans Fats, followed by **Smoothies & Shakes** and **Coffee & Tea.**
- **Beef & Pork** has a total of 6 items with Trans Fat more than 1
- **Smoothies & Shakes** and **Coffee & Tea** has a total of 16 items that has Trans Fat more than 0.

Average Choleseterol
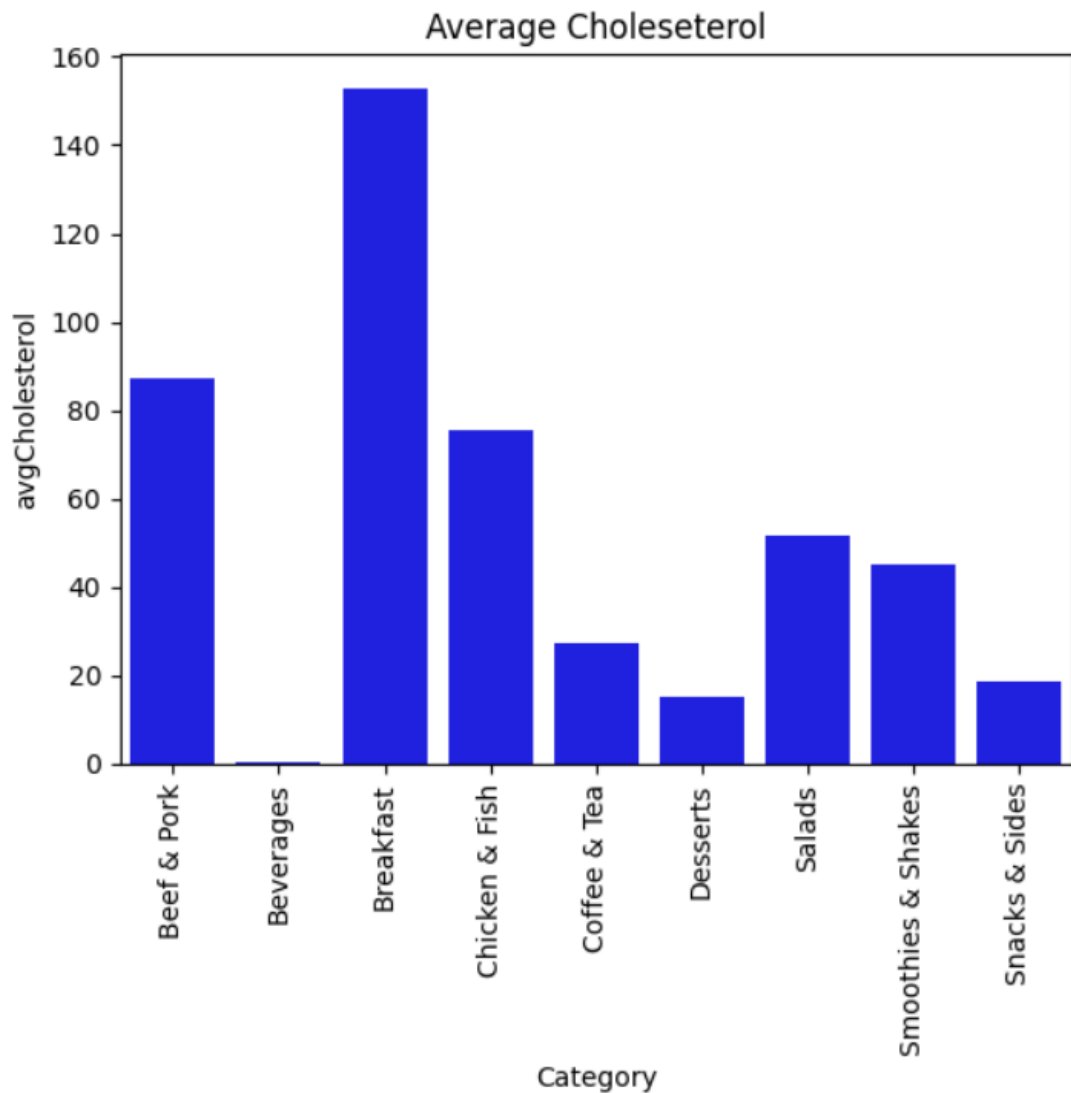
- **Breakfast** accounts for the most amount of average cholesterol, followed up by **Beef & Pork** and **Chicken & Fish.**
- **Beverages** on the other hand accounts for lowest amount of avg. cholesterol, followed up by **Desserts**.
- The cholesterol levels are balanced across whole items, since only 30 items out of 261 has cholesterol has level more than that of allowed level per meal.
- Plus there are only 4 items which contains more than allowed level per day in a single meal, all from **Breakfast** category.
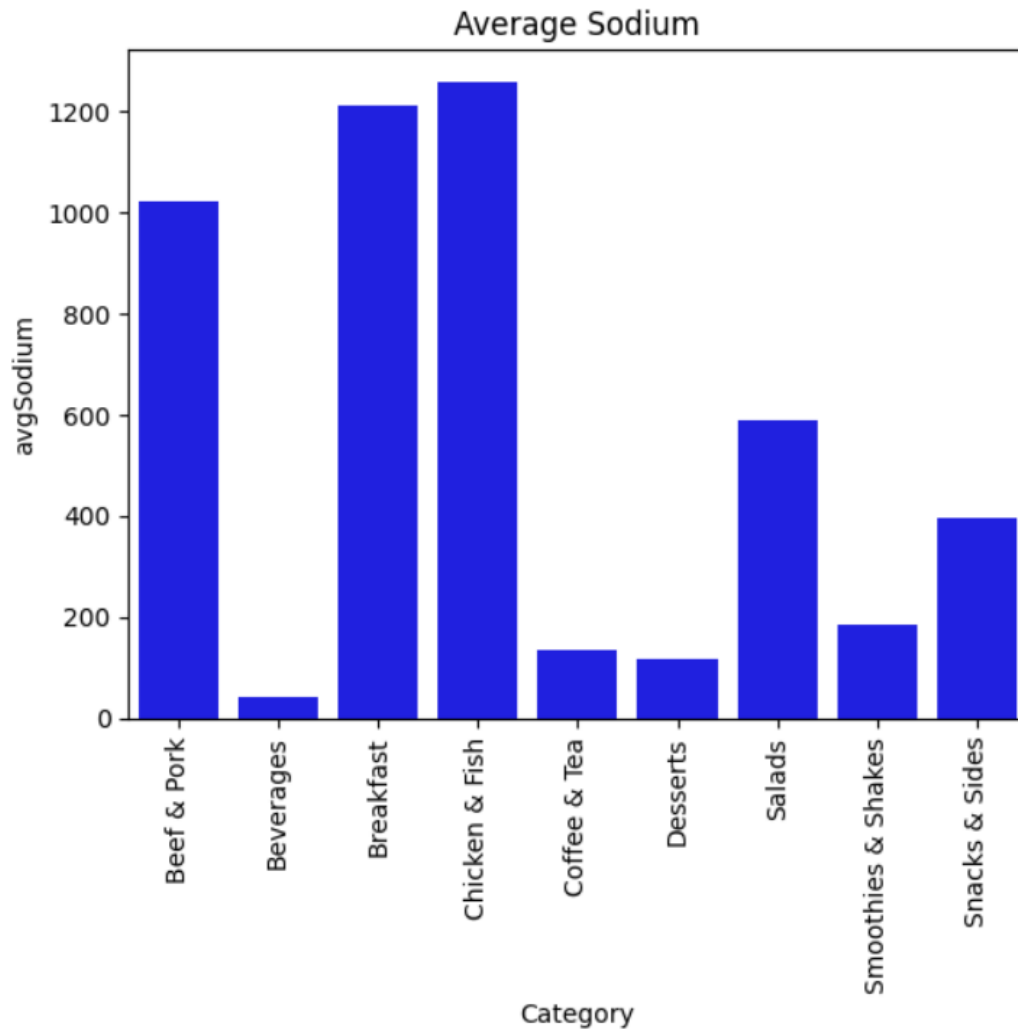
Average Sodium

- Chicken & Fish has the most amount of average Sodium, followed up by Breakfast and Beef & Pork.

- **Beverages** account for lowest amount of average Sodium.
- About 78 food items contains the sodium more than the advised amount for a single meal.
- Only 1 food items contains the sodium more than the advised amount for a day in a single meal. This is **Chicken McNuggets**.
- There are 166 food items which have less sodium content.
- This is because categories like **Coffee & Tea**, **Beverages**, **Smoothies and Shakes** doesn't contain Sodium in higher quantities.

Average Carbohydrates
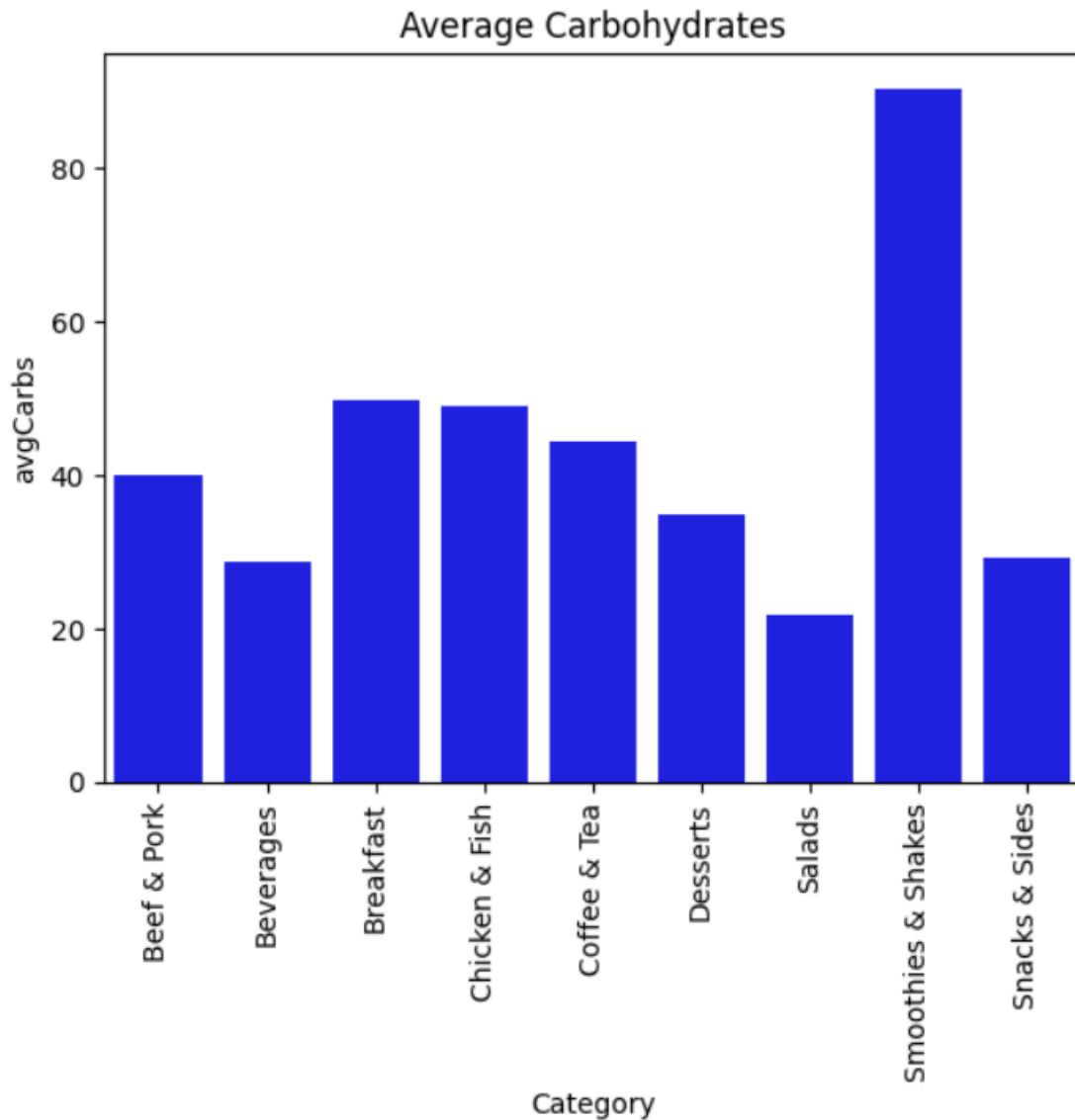
- **Smoothies and Shakes** contains most amount of average carbohydrates.
- Followed by **Breakfast** and **Chicken & Fish**.
- In bar plot we can see that **Smoothies and Shakes** have considerably higher level of carbohydrates. This could be because of some outlier inside Smoothies and Shakes.
- There are 20 items that contains carbohydrates more than the advised limit per meal.
- Unlike others there are no items that cross the limit of maximum amount of advised limit per day.

Average Dietary Fiber
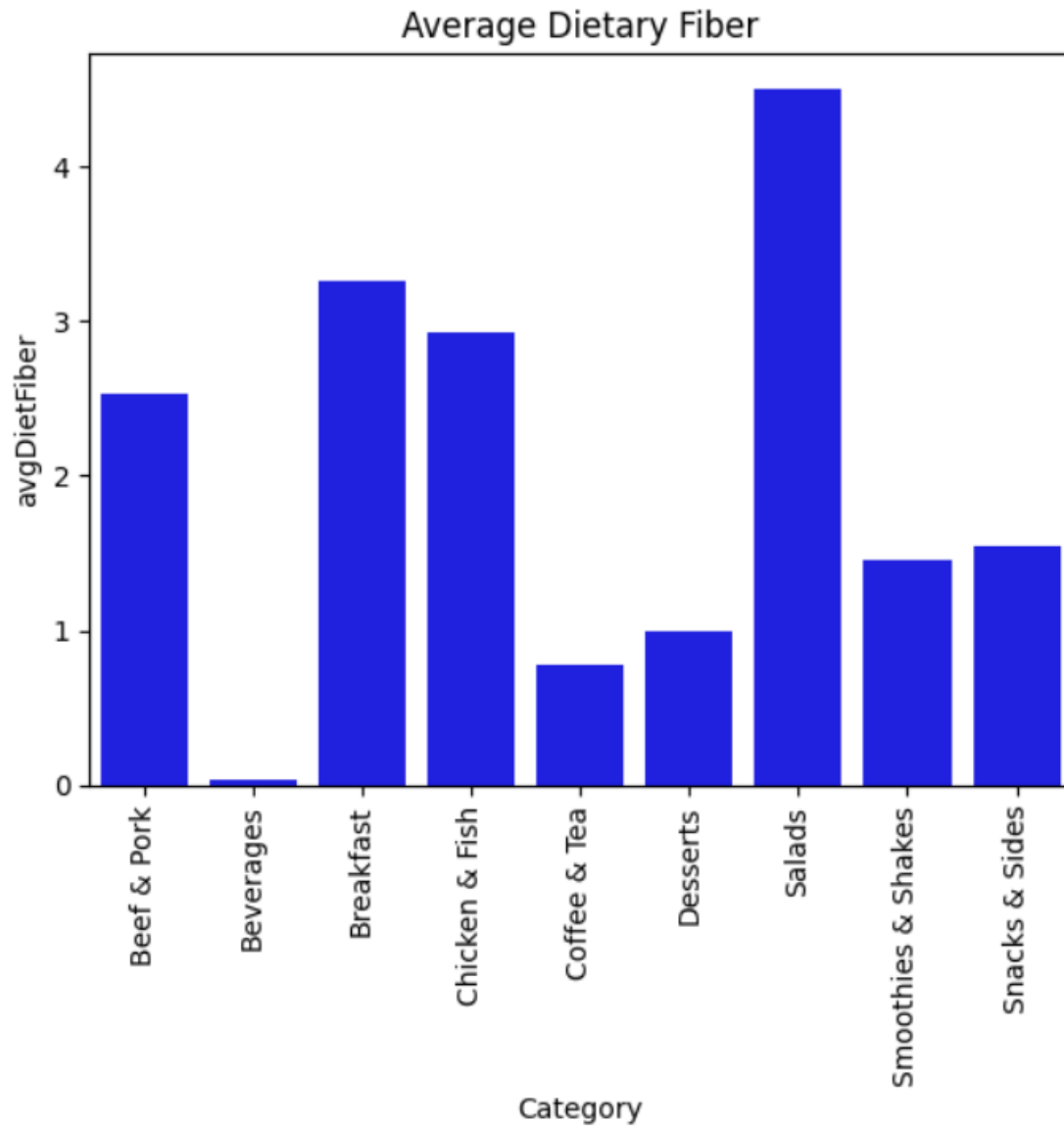
- **Salads** contains the most amount of average dietary fibers.
- Followed up by **Breakfast** and **Chicken & Fish**.
- **Beverages** which is obvious contains the least amount of dietary fibers.
- It is to be noted that none of the food items contains more than the allowed level of Dietary Fiber for a single meal.
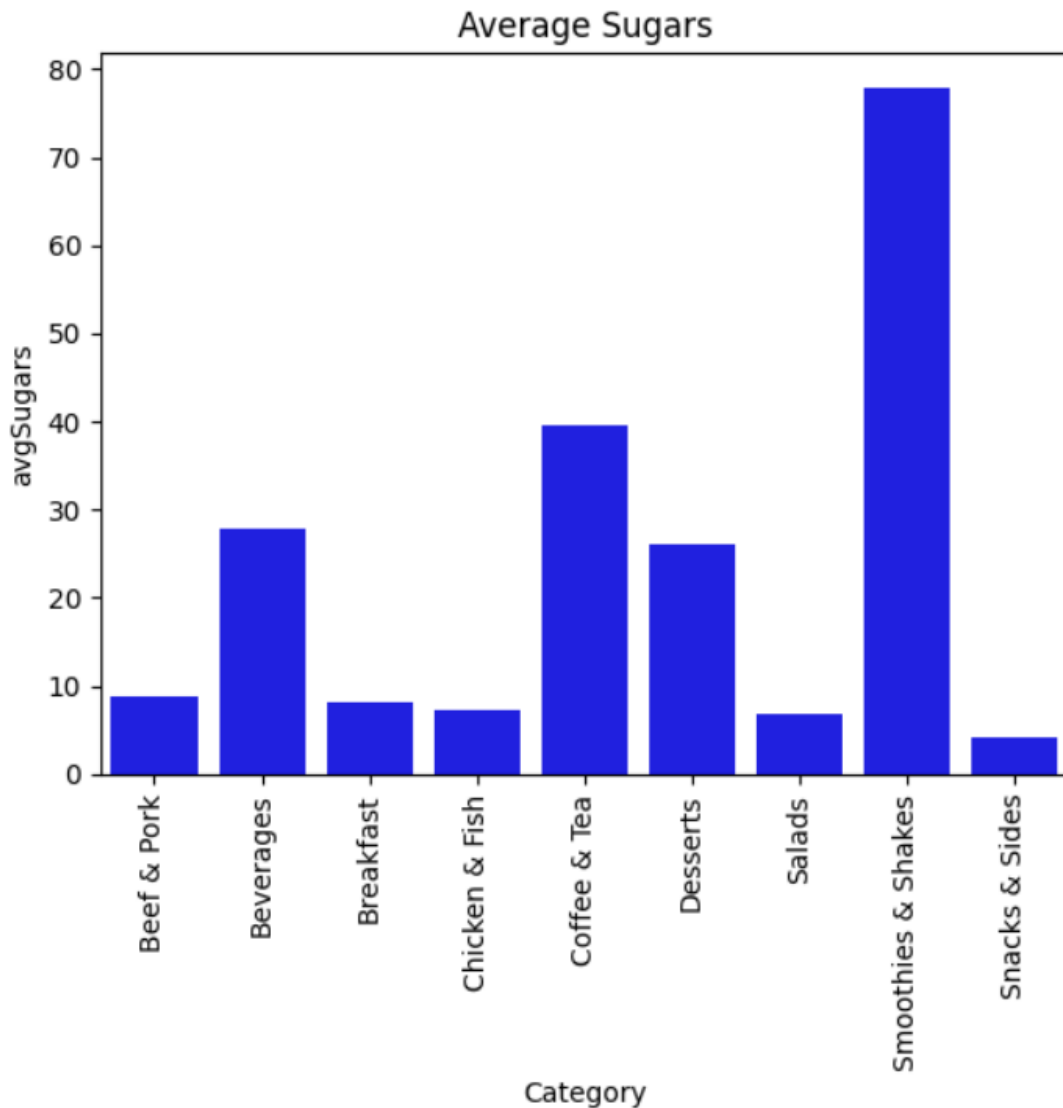
Average Sugars

- For sugars level, we have **Smoothies & Shakes** leading the chart reaching the mark of 80.

- **Coffee and Tea**, **Beverages** and **Desserts** are also within the range of 30-40.

- **Snacks & Slides** amount for the least amount of sugar contents.

- Categories like **Beef & Pork**, **Breakfast**, **Chicken & Fish**, **Salads** and **Snacks & Slides** contains the sugar level in range of less than 10.

- There are almost 110 items that contains added sugar more than the advised limit for a day in one single meal.
- Meaning after consuming these items, concerned person should not consume any sugars for rest of the day, in order to create a balance.
- It is observed that there are 65 items in **Coffee & Tea**, 28 in **Smoothies & Shakes** and 12 in **Beverages** that has higher level of sugars than the advised level.

- It is to be noted that **Coffee & Tea** contains a total of 95 out of which 65 items have high Sugar level, and what's suprising that all items in **Smoothies & Shakes** have a high Sugar level, and more than 50% of Beverages contains high Sugars.
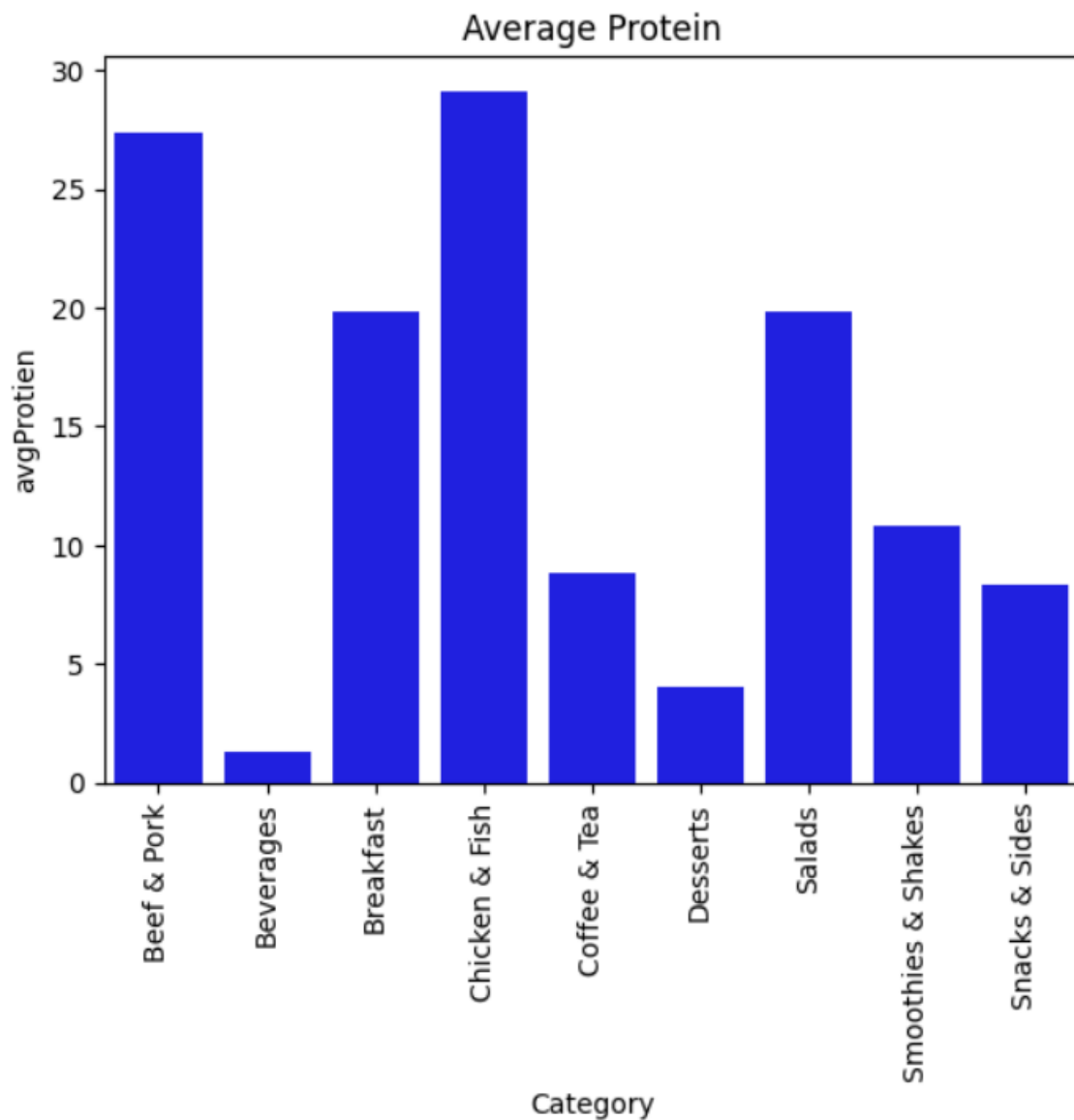
Average Protein

- **Chicken & Fish** contains the most amount of average Protein, followed up by **Beef & Pork**.

- **Breakfast** and **Salads** are tied for their Protein contents.

- **Beverages** contains the least amount Potein which is justified, followed up by **Desserts**.

- There are around 21 food items in total that has less amount of fats and enough amount of proteins.
- The fat level are as low as 20% of the daily allowed value, with protein more than 14.
- There are only 6 Categories that fall into this criteria of less fats and higher proteins and they are **Coffee & Tea**, **Snacks & Sides**, **Chicken & Fish**, etc.

- There are a total of 105 food items from all food items which contains nutrients in a limited and allowed quantity.
- Most of these items are from category **Coffee & Tea**, followed up by **Beverages** and **Smoothies & Shakes**.
- The good thing about this was that there are no food items for which the allowed limit was crossed in all nutrients.

NOTE: This distribution is based on the basis of %Daily Allowed Value for a particular meal. It is to check for those items which don't cross the limit of allowed value. As seen in above illustrations there are for each nutreints items that are rich in it. This is to just access some of the options that a person could choose from for most optimal diet.

Healthy Items Distribution
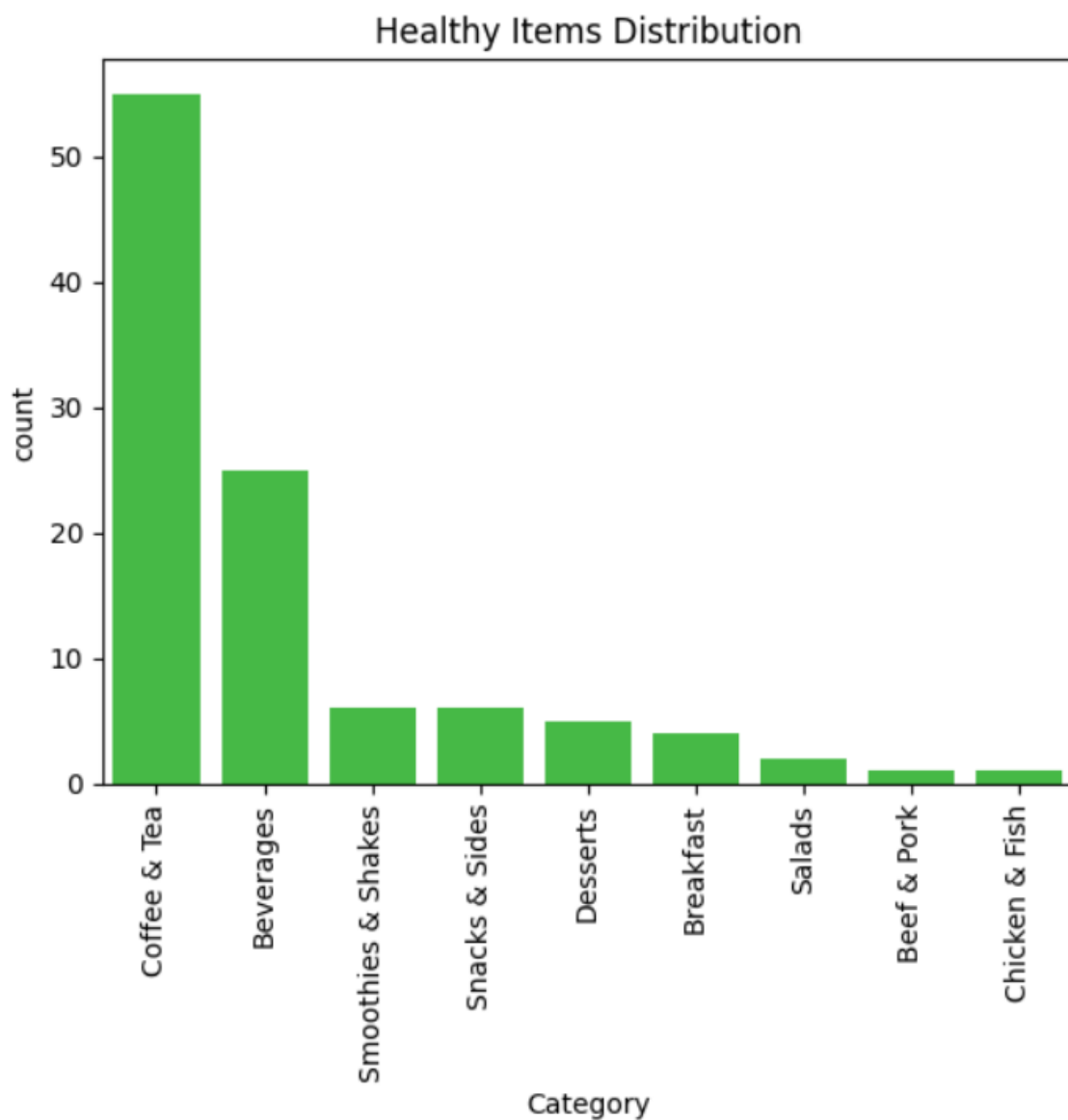
Opportunities for Business:

1. We can market around 50% of our food items as strictly healthy. NOTE: Healthy here means that these products contains nutrients in allowed level and not more than that. This will help in catering those customers who are more conscious about the nutrient intake from their meals.
2. We can reduce the number of items with saturated fats, as more than 100 food items out of 261 contains saturated fats more than the allowed level per meal. This could be done by modifying and experimenting with processes.
3. Same for sugars, it also have more than 100 items that has level more than allowed level for a single meal, this signifies as scope for improvement.

[Github Repository](#)